B1 cont'd

alignment marks. In general, movement of the object tables MT, WT will be realized with the aid of a long stroke module (coarse positioning) and a short stroke module (fine positioning), which are not explicitly depicted in Figure 1. --

IN THE CLAIMS

Please cancel claims 9 and 11-13 without prejudice or disclaimer.

Please enter amended claims 1, 15 and 16 as follows:

C1

1. (Twice Amended) A lithographic projection apparatus, comprising:

an illumination system constructed and arranged to supply a projection beam of radiation;

a first object table provided with a first object holder constructed and arranged to hold a mask;

B2

a second object table provided with a second object holder constructed and arranged to hold a substrate;

a projection system constructed and arranged to utilize said radiation to image an irradiated portion of the mask onto a target portion of the substrate; and

at least one of said illumination system and projection system having an optical element with a surface on which radiation is incident and a capping layer covering said surface, said capping layer being formed of a relatively inert material,

wherein said relatively inert material is selected from the group comprising: diamond-like carbon, Ru, Rh, B, TiN, MgF_2, LiF, C_2F_4 and compounds and alloys thereof.

C2

B3

15. (Twice Amended) A device manufacturing method using a lithographic apparatus, the method comprising:

providing a mask containing a pattern to a first object table;

providing a substrate at least partially covered by a layer of energy-sensitive material to a second object table; and

irradiating said mask and imaging irradiated portions of said pattern onto said substrate;

said irradiating comprising directing radiation onto a surface of an optical element, the surface having a capping layer formed of a relatively inert material,

wherein said relatively inert material is selected from the group comprising: diamond-like carbon, Ru, Rh, B, TiN, MgF_2, LiF, C_2F_4 and compounds and alloys thereof.

B4

16. (Amended) A semiconductor device manufactured in accordance with the method of claim 15.

See the attached Appendix for the changes made to effect the above-amended claims.

Please add claims 20-44 as follow:

-- 20. (New) A lithographic projection apparatus, comprising:

an illumination system constructed and arranged to supply a projection beam of radiation;

a first object table provided with a first object holder constructed and arranged to hold a mask;

a second object table provided with a second object holder constructed and arranged to hold a substrate;

a projection system constructed and arranged to utilize said radiation to image an irradiated portion of the mask onto a target portion of the substrate; and

at least one of said illumination system and projection system having a sensor with a surface on which radiation is incident and a capping layer covering said surface, said capping layer being formed of a relatively inert material.

B5

SUB C3

21. (New) The lithographic projection apparatus according to claim 20,

wherein said relatively inert material is selected from the group comprising: diamond-like carbon (C), boron-nitride (BN), boron carbide (B_4C), silicon nitride (Si_3N_4), silicon carbide (SiC), B, Pd, Ru, Rh, Au, MgF_2, LiF, C_2F_4, TiN and compounds and alloys thereof.

22. (New) The lithographic projection apparatus according to claim 20,

wherein said relatively inert material is more inert than material from which remaining portions of said sensor are formed.

23. (New) The lithographic projection apparatus according to claim 20,

wherein said relatively inert material is less easily oxidized than the material from which remaining portions of said sensor are formed.

24. (New) The lithographic projection apparatus according to claim 20,

wherein said relatively inert material is harder than material from which remaining portions of said sensor is formed.

25. (New) The lithographic projection apparatus according to claim 20,

wherein said capping layer has a thickness in the range of from 0.5 nm to 10 nm.

26. (New) The lithographic projection apparatus according to claim 25,

wherein said capping layer has a thickness in the range of from 0.5 nm to 6 nm.

27. (New) The lithographic projection apparatus according to claim 25,

wherein said capping layer has a thickness in the range of from 0.5 nm to 3 nm.

28. (New) The lithographic projection apparatus according to claim 20,

wherein said capping layer comprises two sub-layers of different materials.

29. (New) The lithographic projection apparatus according to claim 20,

wherein said projection beam comprises radiation having a wavelength in the range of from 8 nm to 20 nm.

30. (New) A lithographic projection apparatus, comprising:

an illumination system constructed and arranged to supply a projection beam of radiation;

a first object table provided with a first object holder constructed and arranged to hold a mask;

a second object table provided with a second object holder constructed and arranged to hold a substrate;

a projection system constructed and arranged to utilize said radiation to image an irradiated portion of the mask onto a target portion of the substrate; and

at least one of said illumination system and projection system having an optical element with a surface on which radiation is incident and a capping layer covering said surface, said capping layer being formed of a relatively inert material,

wherein said optical element is a reflector having a multilayer reflective coating on which said capping layer is provided.

31. (New) The lithographic projection apparatus according to claim 30,

wherein said multilayer reflective coating comprises a plurality of layers of a first material having a relatively low reflective index at the wavelength of said projection beam.

32. (New) The lithographic projection apparatus according to claim 31,

wherein said multilayer reflective coating further comprises a plurality of layers of a second material having a relatively high reflective index at the wavelength and alternating with said layers of said first material.

33. (New) The lithographic projection apparatus according to claim 30,

wherein said relatively inert material is more inert than material from which remaining portions of said optical element are formed.

34. (New) The lithographic projection apparatus according to claim 30,

wherein said relatively inert material is less easily oxidized than the material from which remaining portions of said optical element are formed.

35. (New) The lithographic projection apparatus according to claim 30,

wherein said relatively inert material is harder than material from which remaining portions of said optical element is formed.

36. (New) The lithographic projection apparatus according to claim 30,

wherein said capping layer has a thickness in the range of from 0.5 nm to 10 nm.

37. (New) The lithographic projection apparatus according to claim 36,

wherein said capping layer has a thickness in the range of from 0.5 nm to 6 nm.

38. (New) The lithographic projection apparatus according to claim 36,

wherein said capping layer has a thickness in the range of from 0.5 nm to 3 nm.

SUB CA

39. (New) The lithographic projection apparatus according to claim 30,

wherein said relatively inert material is selected from the group comprising: diamond-like carbon (C), boron-nitride (BN), boron carbide (B_4C), silicon nitride (Si_3N_4), silicon carbide (SiC), B, Pd, Ru, Rh, Au, MgF_2, LiF, C_2F_4, TiN and compounds and alloys thereof. .

40. (New) The lithographic projection apparatus according to claim 30,

wherein said projection beam comprises radiation having a wavelength in the range of from 8 nm to 20 nm.

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41. (New) A lithographic projection apparatus, comprising:

an illumination system constructed and arranged to supply a projection beam of radiation;

a first object table provided with a first object holder constructed and arranged to hold a mask;

a second object table provided with a second object holder constructed and arranged to hold a substrate;

a projection system constructed and arranged to utilize said radiation to image an irradiated portion of the mask onto a target portion of the substrate; and

at least one of said illumination system and projection system having an optical element with a surface on which radiation is incident and a capping layer covering said surface, said capping layer being formed of a relatively inert material,

wherein said optical element comprises:

a reflector having a multilayer reflective coating on said surface, said multilayer reflective coating comprising a plurality of layers of a first material having a relatively low refractive index at the wavelength of said projection beam;

layers of a second material having a relatively high refractive index at said wavelength and alternating with said layers of said first material; and

said capping layer comprises:

a first sub-layer of said first material;

a second sub-layer of a third material having a refractive index at said wavelength higher than said first material and being more inert than said second material; and

a third sub-layer formed of a fourth material that is relatively inert, said first, second and third sub-layers being provided in that order with said third sub-layer outermost.

42. (New) The lithographic projection apparatus according to claim 41,

wherein said third material has a refractive index at said wavelength greater than about 0.95 and an extinction coefficient at said wavelength less than about 0.01.

43. (New) The lithographic projection apparatus according to claim 42,

wherein said first material is one or more materials selected from the group comprising Mo, Ru, Rh, Nb, Pd, Y and Zr, as well as compounds and alloys of these elements;

said second material is one or more materials selected from the group comprising Be, Si, Sr, Rb, RbCl and P, as well as compounds and alloys thereof;

said third material is selected from the group comprising B_4C, BN, diamond-like carbon (C), Si_3N_4 and SiC; and

said fourth material is selected from the group comprising Au, Ru, Rh, Pd, B, MgF_2, LiF, C_2F_4, TiN, boron nitride (BN), boron carbide (B_4C_9), silicon nitride (Si_3N_4), Silicon carbide (SiC), diamond-like carbon (C), and compounds and alloys thereof.

44. (New) The lithographic projection apparatus according to claim 41,

wherein said projection beam comprises radiation having a wavelength in the range of from 8 nm to 20 nm. --